1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product name	Ammonia
Chemical formula	NH3
Company identification	see heading and/or footer
Emergency phone numbers	see heading and/or footer

2 COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation	Substance.
Components/Impurities	Contains no other components or impurities which will influence the classification of the product.
CAS Nr	7664-41-7
EC Nr (from EINECS)	231-635-3

3 HAZARDS IDENTIFICATION

Hazards identification	Flammable Liquefied gas Toxic by inhalation. Corrosive to eyes, respiratory system and skin.

4 FIRST AID MEASURES

Inhalation	Toxic by inhalation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Delayed adverse effects possible.
Skin/eye contact	May cause chemical burns to skin and cornea (with temporary disturbance to vision) Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contaminated clothing. Drench affected area with water for at least 15 minutes Obtain medical assistance
Ingestion	Ingestion is not considered a potential route of exposure.

5 FIRE FIGHTING MEASURES

Specific hazards	Exposure to fire may cause containers to rupture/explode.
Hazardous combustion products	If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Nitric oxide/nitrogen dioxide
Suitable extinguishing media	All known extinguishants can be used.
Specific methods	If possible, stop flow of product. Move away from the container and cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Special protective equipment for fire fighters	Use self-contained breathing apparatus and chemically protective clothing.

6 ACCIDENTAL RELEASE MEASURES

Personal precautions	Evacuate area.
	Use self-contained breathing apparatus and chemically protective clothing.
	Ensure adequate air ventilation.
Environmental precautions	Try to stop release.
	Reduce vapour with fog or fine water spray.
Clean up methods	Ventilate area.
	Hose down area with water.
	Wash contaminated equipment or sites of leaks with copious quantities of water.
	Keep area evacuated and free from ignition sources until any spilled liquid has evaporated.
	(Ground free from frost).

7 HANDLING AND STORAGE

Handling and storage	Keep container below 50°C in a well ventilated place.
	Refer to supplier's container handling instructions.
	Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
	Do not allow backfeed into the container.
	Suck back of water into the container must be prevented.
	Segregate from oxidant gases and other oxidants in store.
	Keep away from ignition sources (including static discharges).
	Purge air from system before introducing gas.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit value for country	UK: Ammonia - LTEL: 25ppm; STEL: 35ppm (EH40/2005)
	Germany: Ammonia-MAK:50ppm
	France: Ammonia - VLE:50ppm; VME:25ppm
Personal protection	Protect eyes, face and skin from liquid splashes.
	Keep suitable chemically resistant protective clothing readily available for emergency use.
	Keep self contained breathing apparatus readily available for emergency use.
	Do not smoke while handling product.
	Ensure adequate ventilation.

9 PHYSICAL AND CHEMICAL PROPERTIES

Molecular weight	17
Melting point	-77.7 °C
Boiling point	-33 °C
Critical temperature	132 °C
Relative density, gas	0.6 (air=1)
Relative density, liquid	0.7 (water=1)

Vapour Pressure 20°C	8.6 bar
Solubility mg/l water	530 g/l at 20°C
Appearance/Colour	Colourless gas
Odour	Ammoniacal
Flammability range	15-30 vol% in air.
Autoignition temperature	630 °C
Other data	Owing to this substance's low flammability, it is classified as non-flammable for transport purposes.

10 STABILITY AND REACTIVITY

Stability and reactivity	Can form explosive mixture with air. May react violently with oxidants. May react violently with acids. Reacts with water to form corrosive alkalis.

11 TOXICOLOGICAL INFORMATION

General	May cause serious damage to eyes. May cause inflammation of the respiratory system and skin. Inhalation of large amounts leads to bronchospasm, laryngeal oedema and pseudomembrane formation.
LC50/1h (ppm)	4000 ppm

12 ECOLOGICAL INFORMATION

General	May cause pH changes in aqueous ecological systems.

13 DISPOSAL CONSIDERATIONS

General	Avoid discharge to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Gas may be scrubbed in water. Gas may be scrubbed in sulphuric acid solution. Contact supplier if guidance is required.

14 TRANSPORT INFORMATION

Proper shipping name	AMMONIA, ANHYDROUS
UN Nr	1005
Class	2.3
Subsidiary risk	8
ADR/RID Classification code	2TC
ADR/RID Hazard Nr	268
Packing group	None

Labelling ADR	Label 2.3: toxic substance. Label 8: corrosive substance.
IMDG EmS codes	F-C, S-U
IMDG Marine pollutant	No
IATA passenger packing instruction	Forbidden
IATA passenger max. quantity/pack	Forbidden
IATA cargo packing instruction	200
IATA cargo max. quantity/pack	25kg
Other transport information	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and: - cylinder valve is closed and not leaking - valve outlet cap nut or plug (where provided) is correctly fitted - valve protection device (where provided) is correctly fitted - there is adequate ventilation. - compliance with applicable regulations.

15 REGULATORY INFORMATION

Number in Annex I of Dir 67/548	007-001-00-5.
EC Classification	R10|T;R23|C;R34|N;R50
-Symbols	T: Toxic N: Dangerous for the environment
Labelling of cylinders	
-Symbols	Label 8: corrosive substance. Label 2.3: toxic substance.
-Risk phrases	R10 Flammable R23 Toxic by inhalation. R34 Cause burns (to eyes, respiratory system and skin). R50 Very toxic to aquatic organisms.
-Safety phrases	S9 Keep container in well ventilated place. S16 Keep away from ignition sources - No smoking. S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S33 Take precautionary measures against static discharges. S36/37/39 Wear suitable protective clothing, gloves and eye/face protection. S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

16 OTHER INFORMATION

Ensure all national/local regulations are observed.

Ensure operators understand the flammability hazard.

Ensure operators understand the toxicity hazard.

Users of breathing apparatus must be trained.

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

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